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U.S. DEPARTMENT OF AGRICULTURE FOREST PEST LEAFLET 104

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RECEIVED
Pales Weevil

By Charles F. Speers, research entomologist,
Southeastern Forest Experiment Station, Asheville, N.C.

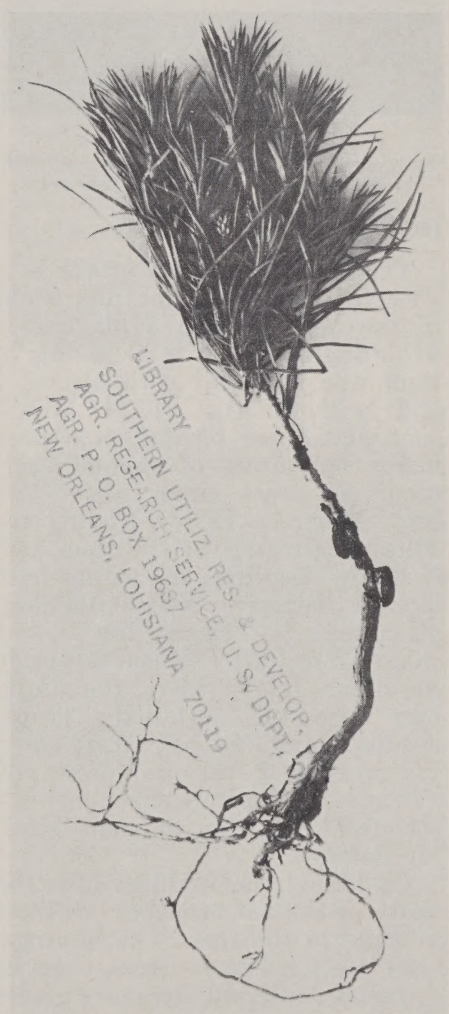
The pales weevil, *Hylobius pales* (Herbst.), is the most serious insect pest of pine reproduction in Eastern United States. Great numbers of seedlings are damaged or killed by the adult weevils who feed on the bark, often so heavily that the trees are girdled (fig. 1). Weevil feeding damages as much as 90 percent of the advance reproduction (up to 3 to 4 feet), or of seedlings planted on cutover pine lands. This damage is generally difficult to detect, because dead and dying seedlings resemble the slash and dying branches that remain following a cutting.

For over 100 years after the weevil was first described, no one recognized its damage or its importance as a seedling pest, partly because it feeds at night. Before 1916 foresters thought that it was the released hardwoods which crowded out the seedling pines. Later studies showed that pales weevils caused the very heavy pine seedling mortality. For the past 50 years this weevil has been considered a pest in the Northeast. Since 1950 it has also become an increasingly serious pest on cutover pine lands in the South.

Range and Host Trees

The insect feeds on all pine species in Eastern North America, that is, in all States east of the Great Plains (including eastern Texas) and in Canada from southern Ontario to Nova Scotia. Within this range spruce, fir, hemlock, juniper, larch, cedar, and cypress have also

been attacked occasionally, but hardwoods only rarely. It is doubtful that any conifers in Eastern United States are immune to attack.



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Figure 1.—Pine seedling girdled and killed by the pales weevil.



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Figure 2.—When weevil feeding is scattered, the holes fill with oleoresin and heal over.

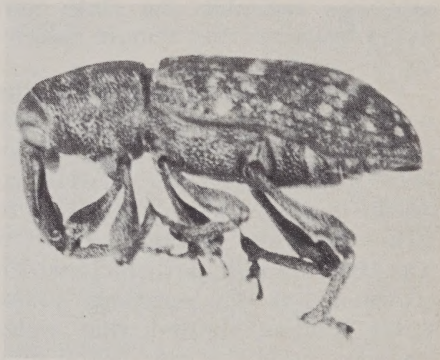
Injury

The first evidence of attack is a series of small holes or pits made in the bark by the adult weevil while feeding. If weevil feeding is light, the holes fill with oleoresin and heal over (fig. 2). If attack continues, these feeding punctures merge and areas of chewed bark occur on trees either above- or below-ground. Heavy feeding results in girdling of the stem and death of seedlings up to one-half inch in diameter. Needle discoloration may be delayed for several weeks after death. When fall feeding occurs in the South, the adults may also kill terminals, twigs, needles, and buds. *Pachylobius picivorus* and various species of *Pissodes* are weevils commonly associated with pines, and cause similar damage.

On large trees, feeding causes the death of ends of branches but little damage to the tree. On saplings, such as Christmas trees, weevils attracted to the cut trees may girdle the lower branches of residual trees, making them unsuitable for the Christmas tree market.

Description of the Stages

The adult is an oblong, robust beetle, black to dark reddish brown in color, varying in length from about one-quarter to three-eighths inch. The wing covers are marked by small, scattered patches of yellowish hairs arranged in a somewhat irregular pattern (fig. 3). The small, slightly oblong, pearly-white egg is about one-thirtieth inch long. The larva is a white, legless, cylindrical grub with a reddish-brown head capsule. When fully grown, the larva is up to one-half inch long, slightly larger than the adult. The pupa is white and about the same size as the adult. The eggs, larvae, and pupae are rarely seen because they occur beneath the bark in pine roots and stumps.



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Figure 3.—Side view of the pales weevil. (About 6 times actual size.)

Life History

Most weevils come out of hibernation in May in the North and in April or earlier in the South, depending on elevation. After a short feeding period, when they are active at night and hide in the soil near the base of the seedling during the day, they fly to recently cut or damaged pine areas. Here they feed, mate, and lay eggs in the roots of cut pine stumps or weakened trees. The weevils may burrow

through the soil a few inches to more than a foot for this purpose. The eggs hatch in 10 to 14 days, and the larvae begin tunneling beneath the bark.

In the South most larvae reach full size by September, and pupate in the sapwood in individual cells covered over with shreds of excelsiorlike wood. The new weevils emerge in late September and October and feed on pine bark, buds, and needles before entering the soil for winter hibernation. A partial second, overlapping generation reportedly occurs annually in the South. In the North, where some adults live for 2 years, the brood may overwinter as larvae in the roots or as adults beneath the litter.

Control Through Management

When possible, cutting operations should be scheduled in a good seed year. This will generally assure several thousand seedlings per acre. Even though weevils may kill many of the seedlings, enough will remain to stock the area adequately, although the distribution pattern of surviving seedlings may be irregular or otherwise undesirable.

Weevil damage in the South can be reduced by planting only on areas where pine was cut or disturbed before July. In the North, this waiting period may be as long as 2 years. This time lapse allows breeding conditions to deteriorate in pine stumps and roots and the area to lose its attractiveness for the weevils.

Landowners may prefer not to wait before establishing new seedlings. In the South, if a stand is to be established by direct seeding, it can be done immediately following cutting because seedlings are rarely attacked before the end of the first growing season. By this time, disturbed areas are no longer attractive to the weevils. In the

North, a 1-year waiting period before reseeding appears desirable.

Control With Insecticides

Seedlings to be planted on recently cutover pine lands, on areas adjacent to recent cutting or site preparation, or immediately following fires or where trees have been killed by other disturbances should be chemically treated. Damage is proportionally greater nearer the source of the weevil attraction.

The recommended treatments protect seedlings by reducing the amount of weevil feeding damage to a level below that which causes tree mortality.

Dipping the stem and needles of seedlings down to the roots in a 2-percent aldrin or heptachlor, or 5-percent DDT emulsion prior to planting provides good protection for the least cost, because this takes only a little insecticide and little extra labor. (See fig. 4.) Excess insecticide can be drained back into the tank from the seedlings for reuse. Seedling protection by this method may vary from 70 to 100 percent, depending both on the number of weevils and seedlings present.

Better protection can be obtained by applying a band of granular insecticide to the soil around the dipped seedlings at planting time. One to three teaspoons of 2 percent granular aldrin or heptachlor should be scattered on the soil in a 2-inch radius around the base of each dipped seedling. The granular material is toxic to weevils hiding in the soil, and the dip is toxic to weevils feeding on the seedlings. Because both the dipping and granular treatments can be applied during the planting operation, little extra labor is involved. Seedling protection by this method may vary from 90 to 100 percent.

Spraying the seedlings and the soil surface surrounding them is very effective, but quite expensive.



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Figure 4.—Dipping pine seedlings in insecticide to protect them from pales weevil damage.

Following planting, the seedlings and soil surface in a 2-inch radius around the stem are sprayed with 2 to 3 ounces of $\frac{1}{2}$ -percent aldrin or heptachlor water emulsion. This spray material is toxic to the weevils while they are hiding in the ground and while they are feeding. It is the most effective method for protecting valuable planting stock, advanced natural reproduction on cutover lands, untreated plantations, or trees on areas adjacent to pine disturbances. Spraying generally provides 90 to 100 percent protection.

Caution: All insecticides are poisonous and if improperly handled or applied may be injurious to humans, domestic animals, desirable plants, beneficial insects, fish, and wildlife. Also, they may contaminate water supplies. Store them in plainly labeled containers away from all food products. In handling these chemicals, follow the directions and heed precautions given on the container. Dispose of unused chemicals so that they will

not contaminate man, animals, or water. *Gloves with a rubberized or plastic coating should be worn by persons handling insecticides or treated trees.*

References

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- Pales weevil rapidly becoming serious pest of pine reproduction in the South. C. F. SPEERS. J. Forest. 56: 723-726. 1958.



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